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EXAMINER	
PERILLA, JASON M	
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2634	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/750,058	Applicant(s) GERLACH, CHRISTIAN GEORG
	Examiner Jason M Perilla	Art Unit 2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 29 December 2000.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 29 December 2000 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Claims 1-15 are pending in the instant application.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). A certified copy of German application No. 100.00.008.8 has been received and placed in the file.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

4. Claim 9 recites the limitation "the phase relation" in line 2. There is insufficient antecedent basis for this limitation in the claim.

5. Claim 10 recites the limitation "the phase" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 3, 6-8 and 10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claim 3, one skilled in the art has not been enabled by the specification to use a mapping to produce a summation. One skilled in the art does has not been enabled by the specification to gather a summation from a mapping. It is understood that one would create a mapping from a summation but one skilled in the art has not been enabled to produce a summation from a mapping.

Regarding claims 6, the use of a Fourier transform in this child claim is not enabled because no indication of how the transform is to be used is provided. If the Fourier transform is to be used as the method of transforming the time domain samples to the frequency domain, as limited in parent claim 1, then it should be stated in the claim.

Regarding claims 7, the use of a Fourier transform in this child claim is not enabled because no indication of how the transform is to be used is provided. If the Fourier transform is to be used as the method of transforming the time domain samples to the frequency domain, as limited in parent claim 1, then it should be stated in the claim.

Regarding claim 8, claim 8 is rejected as being dependent upon a rejected parent claim.

Regarding claim 10, the method of calculating a complex number describing the phase in twelve real multiplications is not enabled by the specification. One skilled in the art is not able to determine how to calculate the phase by twelve real multiplications as claimed, and would not be able to use the method.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 9, 11, 13-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 9, line 7 states "the second moment with respect to the second moment", and it causes claim 9 to be found indefinite because it is not clear.

Regarding claim 11, the arguments used in the equation must be clearly defined in the claim itself. Claim 11 is found to be indefinite because the terms used in the equation to limit the claim are not defined in the claim itself.

Regarding claim 13, the phrase "type of" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Regarding claim 14, the claim is based toward a device to perform the method of claim 1. This type of hybrid claim is not definite because it is not clearly a device or a method. Further, claiming a device having such means to perform a method does not

clearly and distinctly claim the means. One can not distinctly determine exactly what means should be used to perform the method of claim 1.

Regarding claim 15, claim 15 is rejected as being dependent upon a rejected parent claim.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-4, 6, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo et al (6021165) in view of Cahill (5150384).

Regarding claim 1, Ohkubo et al discloses a method for detecting an information signal, tone and/or phase change of a tone in one or more signals which contain inter alia this information signal or this tone (fig. 1; col. 1, lines 5-10) characterized in that the signal is made available for further processing in the form of sample values (fig. 1, ref. 5; col. 3, lines 65-67) of a signal in the time domain, in that the signal is subjected to transformation, for example transformation from the time domain to the frequency domain (fig. 1, ref. 6; col. 4, lines 1-2), to produce at least one output value, and in that a decision in relation to the detection is made with the aid of the at least one output value of the transformation (col. 4, lines 4-8). Ohkubo et al discloses a method of receiving a signal that has a plurality of carriers or tones present (an OFDM signal) that are phase shift key (PSK) modulated (col. 2, line 62 – col. 3, line 7). Further, a

disclosure is made that the signal is sampled in the time domain and transformed into the frequency domain. The symbol decisions are made according to the output of the transformation of the time domain samples into the frequency domain. Ohkubo et al does not disclose that the signal is divided into time segments (blocks), in that only a selection of the blocks are further processed for detection, whereas the blocks not selected are not further processed. However, Cahill teaches a time division multiplex access (TDMA) system where the data received has been portioned into blocks (fig. 4). The receiver system of Cahill is designed so that each receiver in the system would only respond to and process blocks that are designated to it (col. 4, lines 25-30). The blocks that are not designated to be received by the receiver are not further processed. Cahill further teaches that the TDMA method can be advantageous because a greater number of information signals may be transmitted in a particular frequency band (col. 4, lines 17-20). For instance, Cahill teaches that in a cellular phone TDMA system, many phones may be able to use the same frequency (col. 4, lines 20-25). One skilled in the art understands the advantages of using a TDMA modulation system. Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize the TDMA modulation method where a received signal is divided into blocks as taught by Cahill in the receiver method of Ohkubo et al because the system of Ohkubo could be advantageously modified to allow for multiple users to use the same carrier frequency.

Regarding claim 2, Ohkubo et al in view of Cahill disclose the limitations of claim 1 as applied above. Further, Ohkubo et al discloses that the output values of the

transformation of a plurality of selected blocks are mapped by a function or mapping in at least one result, and in that the result is used to produce a decision value (col. 3, lines 1-7).

Regarding claim 3, Ohkubo et al in view of Cahill disclose the limitations of claim 2 as applied above. Further, Ohkubo et al discloses that the mapping provides a summation which is complex if desired (col. 3, line 8).

Regarding claim 4, Ohkubo et al in view of Cahill disclose the limitations of claim 2 as applied above. Further, Ohkubo et al discloses that the mapping represents a product formation which is complex if desired (col. 4, lines 21-27).

Regarding claim 6, Ohkubo et al in view of Cahill disclose the limitations of claim 1 as applied above. Further, Ohkubo et al discloses that a Fourier transform is used (fig. 1, ref. 6).

Regarding claim 9, Ohkubo et al in view of Cahill disclose the limitations of claim 1 as applied above. Further, because the method of Ohkubo et al in view of Cahill discloses a method of receiving digital signals of PSK signals, it is inherent that the method will determine the changes in phase between different blocks or samples or blocks of samples to be able to receive the data that was transmitted.

12. Claims 1-4, 6-7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo et al in view of Yonge III (6111919).

Regarding claim 1, Ohkubo et al discloses a method for detecting an information signal, tone and/or phase change of a tone in one or more signals which contain inter alia this information signal or this tone (fig. 1; col. 1, lines 5-10) characterized in that the

signal is made available for further processing in the form of sample values (fig. 1, ref. 5; col. 3, lines 65-67) of a signal in the time domain, in that the signal is subjected to transformation, for example transformation from the time domain to the frequency domain (fig. 1, ref. 6; col. 4, lines 1-2), to produce at least one output value, and in that a decision in relation to the detection is made with the aid of the at least one output value of the transformation (col. 4, lines 4-8). Ohkubo et al discloses a method of receiving a signal that has a plurality of carriers or tones present (an OFDM signal) that are phase shift key (PSK) modulated (col. 2, line 62 – col. 3, line 7). Further, a disclosure is made that the signal is sampled in the time domain and transformed into the frequency domain. The symbol decisions are made according to the output of the transformation of the time domain samples into the frequency domain. Ohkubo et al does not disclose that the signal is divided into time segments (blocks), in that only a selection of the blocks are further processed for detection, whereas the blocks not selected are not further processed. However, Yonge III teaches a method for receiving OFDM signals using a rectangular, or preferably, a Hamming window to further aid in the reception of a signal in the presence of a jamming or noise signal (fig. 14, ref. 152; col. 6, line 49 – col. 7, line 4). Yonge III teaches that the use of a Hamming window or block is the most advantageous because it produces a frequency domain peak that is more narrow than a rectangular filter and hence, the signals can be more clearly resolved (col. 7, lines 19-39). The rectangular or Hamming window functions (col. 6, eq. 1; col. 7, eq. 2) create blocks out of the signals to be received as they are applied. The blocks that are not selected are not further processed by the system. Therefore, it

would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize a window function as taught by Yonge III in the receiver method of Ohkubo et al because it would further aid the system to make correct symbol decisions.

Regarding claim 2, Ohkubo et al in view of Yonge III disclose the limitations of claim 1 as applied above. Further, Ohkubo et al discloses that the output values of the transformation of a plurality of selected blocks are mapped by a function or mapping in at least one result, and in that the result is used to produce a decision value (col. 3, lines 1-7).

Regarding claim 3, Ohkubo et al in view of Yonge III disclose the limitations of claim 2 as applied above. Further, Ohkubo et al discloses that the mapping provides a summation which is complex if desired (col. 3, line 8).

Regarding claim 4, Ohkubo et al in view of Yonge III disclose the limitations of claim 2 as applied above. Further, Ohkubo et al discloses that the mapping represents a product formation which is complex if desired (col. 4, lines 21-27).

Regarding claim 6, Ohkubo et al in view of Yonge III disclose the limitations of claim 1 as applied above. Further, Ohkubo et al discloses that a Fourier transform is used (fig. 1, ref. 6).

Regarding claim 7, Ohkubo et al in view of Yonge III disclose the limitations of claim 1 as applied above. Further, Yonge III discloses that the time signal is multiplied by a window before the Fourier transform occurs (col. 6 lines 37-47; fig. 14, refs. 152, 153).

Regarding claim 9, Ohkubo et al in view of Yonge III disclose the limitations of claim 1 as applied above. Further, because the method of Ohkubo et al in view of Yonge III discloses a method of receiving digital signals of PSK signals, it is inherent that the method will determine the changes in phase between different blocks or samples or blocks of samples to be able to receive the data that was transmitted.

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo et al in view of Cahill, and in further view of Chen (5729577).

Regarding claim 5, Ohkubo et al in view of Cahill disclose the limitations of claim 1 as applied above. Ohkubo et al in view of Cahill do not disclose that the transformation is frequency selective and has been adjusted to the frequency of the tone currently to be detected. However, Chen teaches a receiver that utilizes a Fourier transform (col. 1, lines 20-35). Chen further teaches that Fourier transform calculations are intensive and require expensive digital signal processing (DSP) chips (col. 1, lines 40-47). The method of Chen teaches a frequency selective Fourier transform method to reduce the number of calculations required and hence the cost of the method (col. 1, lines 48-51) by performing a Fourier transform only over the frequencies that may be observed (col. 5, line 32). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize the selective frequency Fourier transform method as taught by Chen in the receiver method of Ohkubo et al in view of Cahill because it leads to the use of less calculations and a cheaper implementation of the method.

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo et al in view of Yonge III, and in further view of Chen.

Regarding claim 5, Ohkubo et al in view of Yonge III disclose the limitations of claim 1 as applied above. Ohkubo et al in view of Yonge III do not disclose that the transformation is frequency selective and has been adjusted to the frequency of the tone currently to be detected. However, Chen teaches a receiver that utilizes a Fourier transform (col. 1, lines 20-35). Chen further teaches that Fourier transform calculations are intensive and require expensive digital signal processing (DSP) chips (col. 1, lines 40-47). The method of Chen teaches a frequency selective Fourier transform method to reduce the number of calculations required and hence the cost of the method (col. 1, lines 48-51) by performing a Fourier transform only over the frequencies that may be observed (col. 5, line 32). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize the selective frequency Fourier transform method as taught by Chen in the receiver method of Ohkubo et al in view of Yonge III because it leads to the use of less calculations and a cheaper implementation of the method.

15. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo et al in view of Cahill, in further view of Godwin et al (4620069), and further view of Chen.

Regarding claim 8, Ohkubo et al in view of Cahill disclose the limitations of claim 6 as applied above. However, Ohkubo et al in view of Cahill do not disclose that the Fourier transform is computed by using a Goertzel function (fig. 7; col. 18, lines 29-44).

However, Godwin et al teaches the advantages of using the Goertzel function in place of a Fourier transform. Godwin et al teaches that the advantages are ease of implementation in a microprocessor or DSP and that it requires no complex multiplications (col. 18, lines 39-44). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize the Goertzel function in place of the Fourier transform as taught by Godwin et al in the receiver method of Ohkubo et al in view of Cahill because it is easier to implement in a DSP and requires no complex multiplications.

Further regarding claim 8, Ohkubo et al in view of Cahill et al and in further view of Godwin et al do not disclose that the Goertzel function is frequency selective. However, Chen teaches a receiver that utilizes a Fourier transform (col. 1, lines 20-35). Chen further teaches that Fourier transform calculations are intensive and require expensive digital signal processing (DSP) chips (col. 1, lines 40-47). The method of Chen teaches a frequency selective Fourier transform method to reduce the number of calculations required and hence the cost of the method (col. 1, lines 48-51) by performing a Fourier transform only over the frequencies that may be observed (col. 5, line 32). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize the selective frequency Fourier transform method as taught by Chen as a frequency selective Goertzel function in the receiver method of Ohkubo et al in view of Cahill and in further view of Godwin et al because it leads to the use of less calculations and a cheaper implementation of the method.

16. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo et al in view of Yonge III, in further view of Godwin et al, and further view of Chen.

Regarding claim 8, Ohkubo et al in view of Yonge III disclose the limitations of claim 6 as applied above. However, Ohkubo et al in view of Yonge III do not disclose that the Fourier transform is computed by using a Goertzel function (fig. 7; col. 18, lines 29-44). However, Godwin et al teaches the advantages of using the Goertzel function in place of a Fourier transform. Godwin et al teaches that the advantages are ease of implementation in a microprocessor or DSP and that it requires no complex multiplications (col. 18, lines 39-44). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to utilize the Goertzel function in place of the Fourier transform as taught by Godwin et al in the receiver method of Ohkubo et al in view of Yonge III because it is easier to implement in a DSP and requires no complex multiplications.

Further regarding claim 8, Ohkubo et al in view of Yonge III et al and in further view of Godwin et al do not disclose that the Goertzel function is frequency selective. However, Chen teaches a receiver that utilizes a Fourier transform (col. 1, lines 20-35). Chen further teaches that Fourier transform calculations are intensive and require expensive digital signal processing (DSP) chips (col. 1, lines 40-47). The method of Chen teaches a frequency selective Fourier transform method to reduce the number of calculations required and hence the cost of the method (col. 1, lines 48-51) by performing a Fourier transform only over the frequencies that may be observed (col. 5, line 32). Therefore, it would have been obvious for one of ordinary skill in the art at the

time which the invention was made to utilize the selective frequency Fourier transform method as taught by Chen as a frequency selective Goertzel function in the receiver method of Ohkubo et al in view of Yonge III and in further view of Godwin et al because it leads to the use of less calculations and a cheaper implementation of the method.

17. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo et al in view of Cahill, in further view of Fowler (6031418).

Regarding claim 12, Ohkubo et al in view of Cahill disclose the limitations of claim 1 as applied above. Ohkubo et al in view of Cahill do not disclose that the block length (= number of sample values of a block) used for detection is adjusted as a function of the signal/noise ratio (SNR) of the signal in such a way that a substantially constant error rate of detection is achieved over a range of signal/noise ratios. However, Fowler teaches, as is commonly known in the art, that the sampling rate is related to the signal to noise ratio (SNR). Fowler teaches that the sampling rate can be increased to reduce symbol decision errors in the presence of a low SNR (col. 3, lines 44-52). Hence, it is obvious that the signal to noise ratio is influenced by the sampling rate, as is understood in the art. Further, Fowler teaches that the increased sampling rate will require an increase in computational power for demodulation (col. 3, lines 52-55). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to modify the block length as taught by Fowler to balance the block length or sampling rate and the computational power required to process the samples as a function of the SNR in the receiver method of Ohkubo et al in view of

Cahill because the lowest amount of computational power could be utilized to maintain the proper SNR for good reception at all times for the receiving channel.

18. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo et al in view of Yonge III, in further view of Fowler (6031418).

Regarding claim 12, Ohkubo et al in view of Yonge III disclose the limitations of claim 1 as applied above. Ohkubo et al in view of Yonge III do not disclose that the block length (= number of sample values of a block) used for detection is adjusted as a function of the signal/noise ratio (SNR) of the signal in such a way that a substantially constant error rate of detection is achieved over a range of signal/noise ratios. However, Fowler teaches, as is commonly known in the art, that the sampling rate is related to the signal to noise ratio (SNR). Fowler teaches that the sampling rate can be increased to reduce symbol decision errors in the presence of a low SNR (col. 3, lines 44-52). Hence, it is obvious that the signal to noise ratio is influenced by the sampling rate, as is understood in the art. Further, Fowler teaches that the increased sampling rate will require an increase in computational power for demodulation (col. 3, lines 52-55). Therefore, it would have been obvious for one of ordinary skill in the art at the time which the invention was made to modify the block length as taught by Fowler to balance the block length or sampling rate and the computational power required to process the samples as a function of the SNR in the receiver method of Ohkubo et al in view of Yonge III because the lowest amount of computational power could be utilized to maintain the proper SNR for good reception at all times for the receiving channel.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Perilla whose telephone number is (703) 305-0374. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

Jason M Perilla
December 8, 2003

jmp

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